

How to Evaluate Vaginal Bleeding and Discharge

Is the bleeding normal or abnormal? When does vaginal discharge reflect something as innocuous as irritation caused by a new soap? And when does it signal something more serious? The authors' discussion of eight actual patient presentations will help you through the next differential diagnosis for a woman with vulvovaginal complaints.

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Abnormal vaginal bleeding or discharge is one of the most common reasons women come to the emergency department.^{1,2} Because the possible underlying causes are diverse, the patient's age, key historical factors, and a directed physical examination are instrumental in deciding on diagnosis and treatment. This article will review some common case presentations of nonpregnant female patients with abnormal vaginal bleeding, inflammation, or discharge.

ABNORMAL VAGINAL BLEEDING

To ensure appropriate patient management, "Is she pregnant?" should be the first question addressed, since some vulvovaginal signs and symptoms will differ in significance and urgency depending on the answer. If the patient is not pregnant, the gynecologic causes of abnormal vaginal bleeding can be functionally grouped into three categories: ovulatory, anovulatory, and nonuterine bleeding.³

Ovulatory bleeding is associated with regular menstrual periods. This form of bleeding can be further subdivided as hormonal, structural, infectious, or iatrogenic.³ Premenstrual spotting or delayed menses is

typically due to either inadequate levels of estrogen or a persistent corpus luteum. Structural causes of bleeding include leiomyomas, endometrial polyps, or malignancy. Infectious etiologies include pelvic inflammatory disease (PID). Additionally, a variety of bleeding dyscrasias involving platelet or clotting factors can complicate the normal menstrual period. Iatrogenic causes of vaginal bleeding include hormone replacement therapy, steroid hormone contraception, and contraceptive intrauterine devices.³⁻⁵

Anovulatory bleeding is common in perimenarchal girls as a result of an immature hypothalamic-pituitary axis and in perimenopausal women due to declining levels of estrogen. During reproductive years, dysfunctional uterine bleeding (DUB) is the most common cause of abnormal vaginal bleeding.⁵ Almost 90% of DUB results from anovulation.⁵ During an anovulatory cycle, the corpus luteum does not form, causing a failure of progesterone secretion. This results in continued unopposed estradiol, stimulating endometrial proliferation and subsequent irregular vaginal bleeding. Continued elevated levels of estrogen place a woman at risk for developing endometrial cancer. Conversely, breakthrough bleeding may occur in patients taking oral contraceptives that have inadequate doses of estrogen and progestin for the patient or in perimenopausal women with declining levels of estrogen.³⁻⁵

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During reproductive years, dysfunctional uterine bleeding is the most common cause of abnormal vaginal bleeding.

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Suspect DUB when the patient (typically an adolescent or a woman over 40) presents with unpredictable vaginal bleeding despite a normal pelvic examination. As we said earlier, first and foremost, rule out pregnancy. Perform a pelvic ultrasound to rule out structural abnormalities, such as leiomyoma, ovarian cysts, and endometrial polyps. Patients who have had irregular menses since menarche may have polycystic ovarian syndrome, which is characterized by anovulation or oligo-ovulation and hyperandrogenism. These patients will classically be obese, infertile, hirsute, and possibly hyperinsulinemic. Patients with adrenal enzyme defects, hyperprolactinemia, thyroid disease, or other metabolic disorders might also present with vaginal bleeding with anovulation. Thyroid hormone studies and a head computed tomography (CT) scan may be required to confirm the diagnosis.⁵

Dysfunctional uterine bleeding can be categorized as severe, moderate, or mild.⁶ Severe bleeding is associated with hemodynamic instability. Such patients will require resuscitation with intravenous fluids, parenteral estrogen, and possibly dilation and curettage, necessitating hospital admission. The dose of intravenous estrogen is 25 mg every four to six hours until the bleeding stops.⁶ The minimum amount of estrogen to stop the bleeding should be administered to avoid the potential complication of venous thromboembolism. Giving an antiemetic prior to the estrogen will alleviate the side effects of nausea and vomiting.^{5,6}

Moderate DUB is associated with prolonged bleeding and mild anemia without hemodynamic instability. Treatment typically involves hormonal therapy with combined estrogen-progesterone four times a day for seven days.⁵ Estrogen stimulates hemostasis, which will curtail vaginal bleeding. Advise patients of the increased risk of venous thromboembolic events while on estrogen, especially if they smoke. Such

oral contraception may also aggravate an immature hypothalamic-ovarian axis and is recommended only for patients with an established menstrual history.³⁻⁶

Progestin-only hormones are recommended if the patient

is not actively bleeding, can take oral medication, and has a contraindication to high-dose estrogen, such as an estrogen-dependent tumor, a high

risk of venous thromboembolic disease, or hepatic dysfunction. Typical dosing of micronized oral progesterone is 200 mg once daily for the first 10 to 12 days of each month.⁷ Menses should occur within one week of the last dose of progesterone. Other formulations and dosing schedules are available.³⁻⁷

Mild DUB is defined as longer than normal menses for more than two months.⁷ Hormonal therapy is not necessary but may be offered if symptoms worsen. All patients treated for abnormal vaginal bleeding must follow up with their gynecologist or primary doctor for the completion of their DUB workup.³

SIGNS AND SYMPTOMS OF VAGINITIS

Vaginitis or, more correctly, vulvovaginitis, is inflammation of the vulva and vaginal tissues. Typical signs and symptoms are vulvar itching, vaginal discharge, and a vaginal odor. The most common causes of acute vulvovaginitis include infections, irritant or allergic contact, and atrophic vaginitis.^{2,9} The three most frequent infections are bacterial vaginosis caused by an imbalance of the normal flora by *Gardnerella vaginalis*; candidiasis, most commonly caused by *Candida albicans*; and trichomoniasis caused by *Trichomonas vaginalis*.⁹ Infectious vulvovaginitis is typically found in sexually active women, while candidiasis, contact vaginitis, and atrophic vaginitis can occur in women who are not sexually active.^{2,8,9}

Obtain a detailed gynecological and sexual history and perform a pelvic examination in all women with symptoms of vulvovaginitis. Ascertain the use of soaps, douches, and tight clothing or other irritants that may cause inflammation. A history of improperly treated sexually transmitted diseases (STDs), unprotected sexual intercourse, and immunosuppression place women at higher risk for infectious vulvovaginitis. Key aspects of the pelvic examination include the presence and type of discharge, odor, ulcerations, cervical abnormalities, cervical discharge, and cervical motion or adnexal tenderness to palpation. A urine pregnancy test should be performed on all female patients: Some infectious causes of discharge are associated with adverse pregnancy outcomes if not treated.^{2,9}

The cause of vaginal symptoms can typically be determined by history, physical examination, discharge pH determination, and examination of a wet mount. If PID is suspected, a “dirty” or initial-stream urine sample can be obtained for testing of gonorrhea and chlamydia if that modality is available. Al-

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Candidiasis, contact vaginitis, and atrophic vaginitis can occur in women who are not sexually active.

ternatively, endocervical samples may be obtained for gonorrhea and chlamydia testing. Also obtain a midstream urine sample for urinalysis if there is a suspicion of urinary tract infection.

Because symptoms of vulvovaginitis are nonspecific, checking a pH with phenolphthazine (nitrazine) paper and obtaining a wet preparation are recommended for proper diagnosis of discharge. Obtain two discharge samples. Dilute one sample in one to two drops of 0.9% normal saline solution and the second in one to two drops of 10% potassium hydroxide (KOH) solution.⁹ An amine odor after applying the KOH suggests bacterial vaginosis or trichomoniasis.

Each sample is placed on an individual slide with a cover slip and examined as soon as possible under low and high power, looking for characteristics suggestive of each disorder. Motile *T. vaginalis* trichomonads are pear-shaped flagellated organisms best seen within 20 minutes of being placed on the saline slide specimen.¹⁰ Clue cells are epithelial cells with borders obscured by small bacteria, characteristic of bacterial vaginosis, also seen on the normal saline specimen. Yeast or pseudohyphae of *Candida* species are more easily identified in the KOH specimen. However, the absence of trichomonads or pseudohyphae does not rule out these infections due to the low sensitivity of microscopy (approximately 60%).¹⁰

Vulvar inflammation in the absence of vaginal pathogens, along with a minimal discharge, suggests chemical, allergic, or other noninfectious causes of vulvovaginitis.

Often the clinical impression suffices to make treatment decisions, and at times the clinician must treat the patient presumptively prior to the results of laboratory analysis. In cases of sexually transmissible causes of vulvovaginitis, it is recommended that sexual partners be referred for evaluation and treatment and patients abstain from intercourse until symptoms have resolved.⁹

PATIENT PRESENTATION: CASE 1

Concerned parents bring in a 12-year-old girl who has had vaginal discomfort and vaginal spotting for the last two days. She says she has not had menstrual periods. She denies sexual activity, other vaginal discharge, fever, and medication use. She has no past medical history or significant family history. Her urine pregnancy test is negative.

What is the most likely diagnosis?

- laceration
- coagulopathy
- menarche
- nonaccidental trauma/assault
- vaginal foreign body
- infection/STD

The diagnosis is menarche. (This might seem obvious, but a surprising number of parents bring their daughters in for evaluation under these circumstances.) The average age of menarche in North America is 12.5 years, with 10 years being the lower limit.³ However, a perineal and pelvic examination should be performed to ensure the patient does not have a laceration, retained foreign body, or infection. Maintain a low threshold of suspicion for nonaccidental trauma and question the patient alone. Vaginal foreign bodies, especially toilet paper, are more common in younger children, and do not typically present with bleeding but rather infectious concerns.

If the patient does not have significant blood loss, urinary symptoms, or family history of bleeding dyscrasias, she can be discharged with primary physician follow-up as needed and should be told that her menstrual period may not become regular for another one to five years.³

PATIENT PRESENTATION: CASE 2

A 19-year-old woman has had daily vaginal bleeding for months. She has no history of pregnancy, abdominal pain, or sexual activity and does not use birth control. Her last normal menstrual cycle was one year ago. She denies visual problems, heat or cold intolerance, bleeding from other sources, or a family history of bleeding disorders. Her vital signs are normal. She appears obese and reports an unintentional weight gain of 10 pounds in the last year. She has a moderate amount of facial hair and severe acne. Pelvic examination reveals a small amount of blood in the vaginal vault without active bleeding. No masses or tenderness to palpation are elicited on bimanual examination. The urine pregnancy test is negative.

What is the most likely diagnosis?

- endometriosis
- polycystic ovarian disease
- leiomyoma

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Vaginal foreign bodies are more common in younger children and do not typically present with bleeding.

- pelvic inflammatory disease
- cervical cancer
- hyperprolactinemia
- dysfunctional uterine bleeding
- nonaccidental trauma/assault
- vaginal foreign body

This patient's presentation is suggestive of DUB due to polycystic ovarian syndrome. The main clues are consistent with hyperandrogenism: obesity, facial hair, and acne. Family and patient history and physical examination findings are inconsistent with cancer, trauma, or vaginal foreign bodies.

Dysfunctional uterine bleeding is the most common cause of abnormal vaginal bleeding in reproductive-age women and is a diagnosis of exclusion when other organic or structural causes of bleeding have been ruled out.⁵ Patients with DUB will have otherwise unremarkable gynecological examinations. Endometriosis has a more waxing-and-waning course.

Leiomyoma, or uterine fibroid, is a structural cause of vaginal bleeding diagnosed by ultrasound. Visual field deficits, enlarged thyroid, or galactorrhea would suggest a pituitary lesion or hyperprolactinemia.

Refer a patient with vaginal bleeding suggestive of DUB for an ultrasound to rule out structural abnormalities as well as metabolic studies (such as thyroid-stimulating hormone and free T₄ levels) and a head CT scan if there are concerns for a pituitary tumor or hyperprolactinemia.⁵ A wet preparation and point-of-care testing may be necessary if there are concerns for an infectious process.

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An elevated vaginal pH is suggestive of vaginal atrophy, but can also be found in bacterial vaginosis and candidiasis.

This patient exhibits moderate DUB and it would be appropriate to treat her with a combination estrogen-progestin or progestin-only oral contraceptive.⁵ Treatment of DUB is basically

the same whether the patient has polycystic ovarian syndrome or not, but if she does, a progestin with minimal androgenic activity (such as ethynodiol diacetate, norgestimate, and drospirenone) is preferred.¹¹

When treating vaginal bleeding suspicious for DUB, it is important that patients be referred for sonography and laboratory analysis to rule out structural, endocrine, and neoplastic disorders.³

PATIENT PRESENTATION: CASE 3

A 59-year-old patient reports pain with sexual intercourse, reduced lubrication during intercourse, and vaginal spotting. She stopped menstruating nine years ago and has not used hormone replacement therapy. She has no abnormal vaginal discharge and no history of STDs. She has not changed soaps, powders, or panty liners. On physical examination, her external genitalia appear thin and friable. Her vaginal vault is poorly rugated with a small area of ecchymosis at the posterior fourchette.

What is the most likely diagnosis?

- candidiasis
- bacterial vaginosis
- contact irritation
- atrophic vaginitis
- cervical cancer

The diagnosis is atrophic vaginitis. Up to 40% of postmenopausal women have symptoms of this condition.⁸ The vaginal and urethral epithelia are estrogen-dependent. After menopause, circulating levels of estrogen are reduced to approximately one-tenth of previous levels. Reduced vaginal lubrication is the earliest finding of hormone insufficiency. A long-term decline in estrogen is required before symptoms of atrophic vaginitis occur.

Typical signs and symptoms of burning, vulvar pruritus, and yellow malodorous discharge can be exacerbated by a simultaneous infection of candidiasis, trichomoniasis, or bacterial vaginosis; those infections should be ruled out prior to diagnosing atrophic vaginitis. Women who smoke, have not given birth vaginally, or were naturally estrogen-deficient before menopause will have more severe symptoms.⁸ An elevated vaginal pH (exceeding 5 in the vaginal vault) is suggestive of vaginal atrophy, but can also be found in bacterial vaginosis and candidiasis.⁸

Refer the patient to her primary physician to discuss the risks and benefits of systemic estrogen therapy if she is interested. Over-the-counter moisturizers and lubricants can be used as an alternative or adjunctive therapy and help maintain natural secretions for the short term.⁸

PATIENT PRESENTATION: CASE 4

A 25-year-old woman reports having had malodorous vaginal discharge and itching for a week. She has a history of unprotected sex with multiple partners. Her last menstrual period was two weeks ago and

normal for her. She denies a history of STDs, fevers, abdominal pain, or urinary symptoms. Gynecological examination reveals white discharge coating the vaginal walls but no cervical motion tenderness or cervical discharge. The vaginal pH is greater than 4.5.

What is the most likely diagnosis?

- vaginal candidiasis
- trichomoniasis
- bacterial vaginosis
- cervicitis
- pelvic inflammatory disease

The key to the diagnosis—bacterial vaginosis—is the malodorous discharge, although it is not unique to this condition. Bacterial vaginosis occurs when the anaerobic bacteria *G. vaginalis* and *Mycoplasma hominis* replace the normal *Lactobacillus* species in the vagina.^{1,9}

Although malodorous discharge is common in bacterial vaginosis, many women who meet the clinical criteria for diagnosis are asymptomatic. It is not clear if the condition is an STD; however, it is rarely seen in virgins and is associated with having multiple sex partners.⁹

Bacterial vaginosis has been associated with adverse pregnancy outcomes, PID, and postsurgical vaginal cellulitis. A commonly accepted decision tool to diagnose the condition is the Amsel Criteria, which requires three of the following for the diagnosis: thin, white, homogeneous discharge smoothly coating vaginal walls; the presence of clue cells on microscopy (Figure 1); a vaginal fluid pH above 4.5; and release of a fishy odor on adding 10% KOH.^{1,2,12,13}

All symptomatic patients, including pregnant patients, should be treated with metronidazole unless they are allergic. Cure rates are similar for the seven-day metronidazole oral regimen, vaginal gel, and clindamycin vaginal cream, but non-oral metronidazole regimens have higher rates of recurrence.² Vaginal preparations have fewer adverse effects, such as gastrointestinal upset. All patients should avoid alcohol during use of these preparations and 24 hours after oral metronidazole because a disulfiram-like reaction can occur. A woman's response to treatment and likelihood of relapse is not affected by her partner being treated. Therefore, it is not necessary to refer male sexual partners for treatment.¹²

PATIENT PRESENTATION: CASE 5

A 25-year-old woman comes to the emergency department after seven days of malodorous vaginal dis-

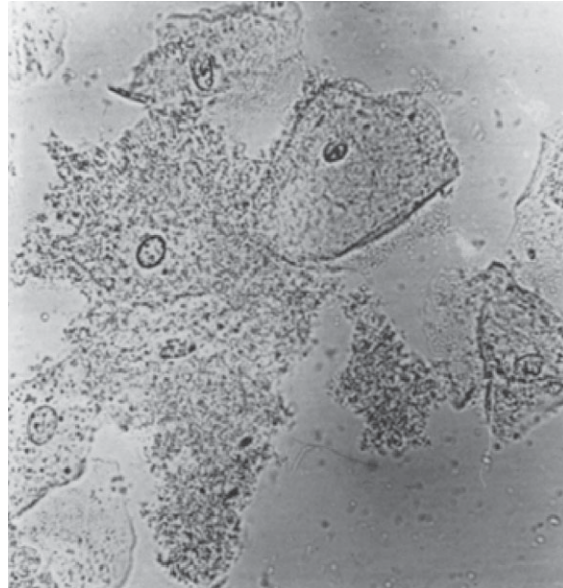


FIGURE 1. Characteristic clue cells suggesting bacterial vaginosis.

charge and itching. She has a history of unprotected sex with multiple partners. She denies a history of STDs, fevers, abdominal pain, or urinary symptoms. Gynecological examination reveals a thin, frothy discharge. Her cervix has areas of punctate hemorrhage but is without discharge or motion tenderness. Her vaginal pH is greater than 4.5.

What is the most likely diagnosis?

- vaginal candidiasis
- trichomoniasis
- bacterial vaginosis
- cervicitis
- chemical vaginitis
- foreign body vaginitis

The diagnosis is trichomoniasis, an STD commonly manifested by vaginitis and discharge. The discharge can be thin and frothy but is often thick and yellow, easily confused with that of candidiasis. The most specific physical examination finding is a “strawberry cervix” with punctate hemorrhage and vesicles or papules. Wet preparation slides must be read within 20 minutes to identify the characteristic trichomonads (Figure 2).¹⁰ As with bacterial vaginosis, the KOH whiff test produces a strong fishy odor. More sensitive point-of-care testing is available. A single dose of metronidazole or tinidazole is effective treatment. It is recommended that all sexual partners

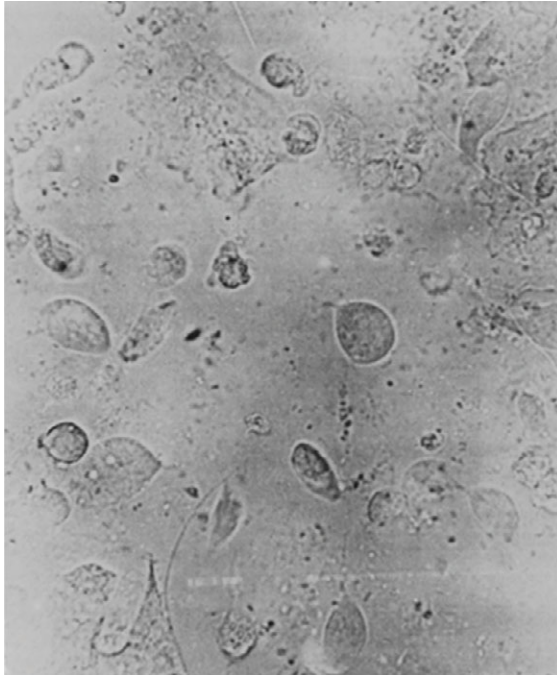


FIGURE 2. Pear-shaped, flagellated trichomonad seen in trichomoniasis.

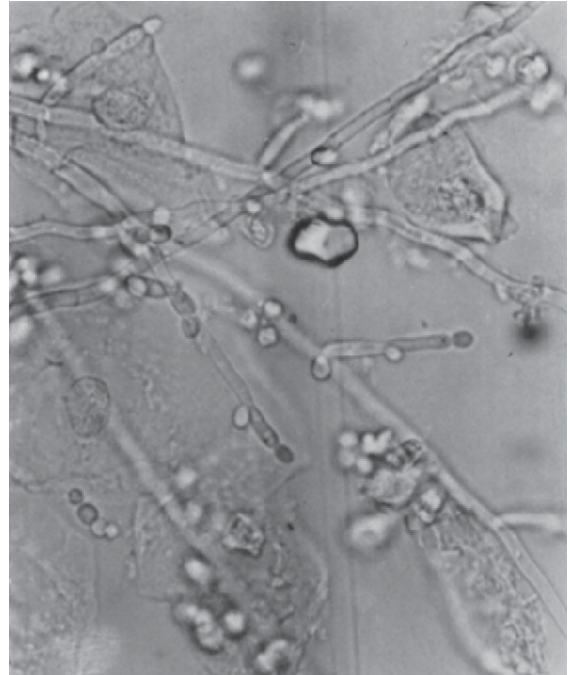


FIGURE 3. Multicellular yeast indicating vulvovaginal candidiasis.

be treated and refrain from intercourse until symptoms resolve.¹⁰

Advise any patient who plans to become pregnant that trichomoniasis during pregnancy is associated with adverse outcomes, such as premature rupture of membranes, preterm delivery, and low birth weight.¹⁰

PATIENT PRESENTATION: CASE 6

A 30-year-old diabetic woman comes to the emergency department after three days of curdy discharge, vaginal pruritus, and pain at her urethral opening on urination. She denies other symptoms. Her home glucose measurements have been normal. On gynecological examination she has a thick white discharge on her vaginal vault, but no cervical motion tenderness or discharge. Her vaginal pH is less than 4.5; the finding on the saline with 10% KOH wet preparation slide is shown in Figure 3.

What is the most likely diagnosis?

- vaginal candidiasis
- trichomoniasis
- bacterial vaginosis
- pelvic inflammatory disease
- genital herpes

The diagnosis is vulvovaginal candidiasis, which is usually caused by *C. albicans*. Most women in the United States will have at least one episode of vulvovaginal candidiasis in their lifetime.¹⁴ Women with diabetes are more prone to this condition due to their immunocompromised state. Typical symptoms include pruritus, soreness, dyspareunia, and the distinguishing curdy discharge. History, physical examination, and wet preparation, identifying the characteristic yeast, will confirm diagnosis. Using 10% KOH on the wet prep will improve visualization by disrupting the cellular material obscuring the yeast.¹²

The majority of infections are uncomplicated. Between 5% and 8% of healthy women will have complicated infections—that is, those that recur four or more times a year or are not caused by *C. albicans*.^{12,14} Oral fluconazole and a variety of over-the-counter vaginal preparations are available for uncomplicated infections. As vulvovaginal candidiasis is not an STD, treatment of sexual partners is not typically indicated except in cases of recurrent infections or when the male is experiencing balanitis (inflammation of the glans penis).¹²

PATIENT PRESENTATION: CASE 7

A 17-year-old has painful lesions on her labia. She admits to having unprotected sex with her boyfriend; she denies systemic symptoms. On physical examination she does not have inguinal lymphadenopathy.

What is the most likely diagnosis?

- syphilis
- chancroid
- genital herpes
- pelvic inflammatory disease
- condylomata acuminata

The diagnosis is genital herpes caused by the herpes simplex virus (HSV), the most prevalent genital ulcerative lesion in the United States among young sexually active patients.¹² The appearance on the ulcer on physical examination has been likened to a dew drop on a rose petal (Figure 4). However, the lesions may be difficult to visualize or to distinguish from those of syphilis or chancroid. The main differences are that syphilis lesions are typically painless, with jagged margins, and chancroid ulcerations are painful with a punched-out appearance and are associated with inguinal adenopathy.

The other possibilities are ruled out by the patient's history and physical examination. Pelvic inflammatory disease is associated with cervical motion or adnexal tenderness. Condylomata acuminata, or anogenital warts, an STD caused by human papilloma virus (HPV) infection, can cause vaginal discharge but does have an ulcerative appearance. Treatment is cryotherapy or topical podophyllin.

Distinguishing the ulcerative lesions by physical examination alone is inaccurate. Therefore, it is recommended that all patients with genital ulcerations undergo serologic testing for syphilis and a diagnostic evaluation for genital herpes. In areas where chancroid is prevalent, a test for *Haemophilus ducreyi* should be performed. Syphilis serology and either darkfield examination or direct immunofluorescence testing is available for *Treponema pallidum*, the causative agent for syphilis. A viral culture or HSV antigen test is appropriate for HSV. Culture is required for *H. ducreyi* as no FDA-cleared polymerase chain reaction test is available in the United States.¹²

Even after a complete diagnostic evaluation, approximately 25% of patients who have genital ulcers are without a confirmed diagnosis because the sensitivity of a viral culture is low, especially for recur-



FIGURE 4. Painful labial lesions resulting from genital herpes.

rent lesions, and sensitivity declines as lesions begin to heal.¹² (Polymerase chain reaction testing has a higher sensitivity.) Consequently, the practical step is to treat for the diagnosis considered most likely on the basis of clinical presentation. Referral for HIV testing should be strongly considered for all patients with genital ulcers caused by HSV and should be performed for all patients with ulcers caused by *T. pallidum*

or *H. ducreyi*. Patients should also advise all sexual partners to seek evaluation and treatment.

PATIENT PRESENTATION: CASE 8

A 20-year-old woman has had lower pelvic pain and abnormal vaginal discharge for four days. She has a history of an unknown STD that was treated with antibiotics. She has been sexually active with multiple partners. Her last menstrual period was 10 days ago and normal for her. She has no vaginal bleeding. She has never been pregnant, although her part-

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It is recommended that all patients with genital ulcerations undergo serologic testing for syphilis and a diagnostic evaluation for genital herpes.

TABLE. Treatment Recommendations**Bacterial vaginosis**First-line treatment options

- Metronidazole 500 mg orally twice a day for 7 days
- Metronidazole gel 0.75%, one full applicator (5 g) intravaginally, once a day for 5 days
- Clindamycin cream 2%, one full applicator (5 g) intravaginally at bedtime for 7 days

Alternatives

- Clindamycin 300 mg orally twice a day for 7 days
- Clindamycin ovules 100 mg intravaginally once at bedtime for 3 days

CandidiasisOral agent

- Fluconazole 150-mg oral tablet in single dose

Intravaginal agents

- Butoconazole 2% cream* 5 g intravaginally for 3 days
- Butoconazole 2% cream 5 g (butoconazole1-sustained release), single intravaginal application
- Clotrimazole 1% cream 5 g intravaginally for 7-14 days*
- Miconazole 2% cream 5 g intravaginally for 7 days*
- Miconazole 200 mg vaginal suppository, one suppository for 3 days*
- Miconazole 1200 mg vaginal suppository*, one suppository for 1 day
- Nystatin 100,000 unit vaginal tablet, one tablet for 14 days
- Tioconazole 6.5% ointment* 5 g intravaginally in a single application

Genital herpes

- Acyclovir 400 mg orally three times a day for 7–10 days

- Acyclovir 200 mg orally five times a day for 7–10 days
- Famciclovir 250 mg orally three times a day for 7–10 days
- Valacyclovir 1 g orally twice a day for 7–10 days

Note: Treatment can be extended if healing is incomplete after 10 days of therapy.

Pelvic inflammatory diseaseFirst-line treatment options

- Levofloxacin 500 mg orally once daily for 14 days**
- Ofloxacin 400 mg orally twice daily for 14 days**

WITH OR WITHOUT

Metronidazole 500 mg orally twice a day for 14 days

Alternatives

- Ceftriaxone 250 mg IM in a single dose and doxycycline 100 mg orally twice a day for 14 days

WITH OR WITHOUT

Metronidazole 500 mg orally twice a day for 14 days

- Cefoxitin 2 g IM in a single dose and probenecid 1 g orally administered concurrently in a single dose and doxycycline 100 mg orally twice a day for 14 days

WITH OR WITHOUT

Metronidazole 500 mg orally twice a day for 14 days

TrichomoniasisFirst-line treatment options

- Metronidazole 2 g orally in a single dose
- Tinidazole 2 g orally in a single dose

Alternative

- Metronidazole 500 mg orally twice a day for 7 days

* over-the-counter preparations

** Quinolones should not be used in persons with a history of recent foreign travel or partners' travel, infections acquired in California or Hawaii, or infections acquired in other areas with increased prevalence of quinolone-resistant *Neisseria gonorrhoeae*.

Source: Workowski KA, Berman SM.¹²

continued on page 48

continued from page 34

ners use condoms irregularly. On physical examination she is noted to be afebrile. Her pelvic examination is remarkable for purulent cervical discharge and exquisite cervical motion tenderness. No uterine or adnexal tenderness is appreciated. The urine pregnancy test is negative.

What is the most likely diagnosis?

- cervicitis
- pelvic inflammatory disease
- genital herpes
- appendicitis

The diagnosis is PID, which comprises a spectrum of disorders of the upper female genital tract that includes endometritis, salpingitis, tubo-ovarian abscess, and pelvic peritonitis. *Neisseria gonorrhoeae* and *C. trachomatis* are the most commonly implicated organisms; however, normal vaginal flora, anaerobes, and enteric pathogens, as well as cytomegalovirus and mycoplasma organisms, have been associated with PID.¹⁵ Rates of PID are higher among young sexually active women where rates of gonorrhea and chlamydia are high.¹²

Pelvic inflammatory disease is difficult to diagnose clinically due to the range of symptoms and signs. But delayed diagnosis and treatment may result in upper reproductive tract abnormalities. Empiric treatment should be initiated in sexually active young women if they are experiencing pelvic or lower abdominal pain and no other cause can be identified, and if cervical motion, uterine tenderness, or adnexal tenderness is present. Additional criteria such as fever, elevated erythrocyte sedimentation rate, elevated C-reactive protein, or documented cervical infection with *N. gonorrhoeae* or *C. trachomatis* support the diagnosis.^{12,15}

Treatment should be started after a presumptive diagnosis is made and should cover gonorrhea and chlamydia. Debate exists as to whether metronidazole should be prescribed to cover anaerobic organisms as well as coexisting infection with bacterial vaginosis. A variety of CDC-recommended parenteral regimens are available.¹¹ Only mild to moderate cases should be treated on an outpatient basis with oral antibiotics; follow-up within 72 hours is essential to ensure improvement. Male sexual partners should be evaluated and treated if they have had sexual contact with the patient within the last two months of symptom onset due to the risk of male urethral infection and patient reinfection.^{12,15}

The Table summarizes the treatment options for the various conditions discussed in this article.¹²

PREVENTIVE TREATMENT

Patients with vulvovaginitis and vaginal bleeding are often seen in the emergency department. A thorough history, focused physical examination, and point-of-care testing are typically sufficient to determine treatment. Beyond that, some common-sense recommendations can help prevent further complications. First, all women should be encouraged to have a Pap smear three years after their first sexual experience or at age 21, whichever comes first, and annually till the age of 30, to screen for cervical cancer. And when STDs are suspected, ideally all partners should be evaluated and treated. □

REFERENCES

1. ACOG Committee on Practice Bulletins—Gynecology. Clinical management guidelines for obstetrician-gynecologists, Number 72, May 2006: Vaginitis. *Obstet Gynecol.* 2006;107(5):1195-1206.
2. Clenney TL, et al. Vaginitis. *Clin Fam Pract.* 2005;7(1):57-66.
3. Morrison LJ, Spence JM. Vaginal bleeding in the nonpregnant patient. In: Tintinalli JE, Kelen GD, Stapczynski JS, eds. *Emergency Medicine: A Comprehensive Study Guide.* McGraw-Hill, 6th ed., 2004:647-653.
4. Bayer SR, DeCherney AH. Clinical manifestations and treatment of dysfunctional uterine bleeding. *JAMA.* 1993;269(14):1823-1828.
5. Dodds NR, Sinert R. Dysfunctional uterine bleeding. Emedicine.com. <http://emedicine.medscape.com/article/795587-overview>. Updated November 12, 2007. Accessed April 3, 2009.
6. Jurema M, Zacur HA. Menorrhagia. UpToDate.com. Updated October 1, 2008. Accessed January 10, 2009.
7. DeSilva NK, Zurawin RK. Management of abnormal uterine bleeding in adolescents. UpToDate.com. Updated August 1, 2007. Accessed January 10, 2009.
8. Bachmann GA, Nevadunsky NS. Diagnosis and treatment of atrophic vaginitis. *Am Fam Physician.* 2000;61(10):3090-3096.
9. Kuhn GJ. Vulvovaginitis. In: Tintinalli JE, Kelen GD, Stapczynski JS, eds. *Emergency Medicine: A Comprehensive Study Guide.* McGraw-Hill, 6th ed., 2004:647-653.
10. Wilkerson RG, Sinert RH, Friedman BW, Brillman JC. Trichomoniasis. Emedicine.com. <http://emedicine.medscape.com/article/787722-overview>. Updated November 12, 2008. Accessed April 3, 2009.
11. Rosenfield RL. Treatment of polycystic ovary syndrome in adolescents. UpToDate.com. Updated January 5, 2009. Accessed January 10, 2009.
12. Workowski KA, Berman SM. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines 2006: Diseases characterized by vaginal discharge. <http://www.cdc.gov/std/treatment/2006/vaginal-discharge.htm>. Accessed April 6, 2009.
13. Association for Genitourinary Medicine, Medical Society for the Study of Venereal Disease. 2002 national guideline for the management of bacterial vaginosis. <http://www.guideline.gov>. Accessed January 20, 2009.
14. Carpenter Rose EA, Hedayati T. Candidiasis. Emedicine.com. <http://emedicine.medscape.com/article/78125-overview>. Updated December 6, 2007. Accessed April 6, 2009.
15. Behrman AJ. In: Tintinalli JE, Kelen GD, Stapczynski JS, eds. *Emergency Medicine: A Comprehensive Study Guide.* McGraw-Hill, 6th ed., 2004:647-653.